UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the November 2004 question paper

0680 ENVIRONMENTAL MANAGEMENT

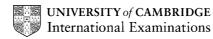### 0680/02   Paper 2, maximum mark 80

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the November 2004 question papers for most IGCSE and GCE Advanced Level syllabuses.

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Grade thresholds taken for Syllabus 0680 (Environmental Management) in the November 2004 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 2	80	54	40	29	24

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
The threshold (minimum mark) for D is set halfway between those for Grades C and E.
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.
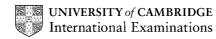Grade A* does not exist at the level of an individual component.

UNIVERSITY *of* **CAMBRIDGE**
International Examinations

November 2004

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0680/02

ENVIRONMENTAL MANAGEMENT
Paper 2

UNIVERSITY *of* CAMBRIDGE
International Examinations

1 **(a)** **(i)** Provides the energy used by plants in photosynthesis,
details about the process of photosynthesis,
plants are the primary producers which support all animal life,
provides warmth/heat that plants/animals need,
supports the water cycle.

(ii) Allows transfer of nutrients from the roots,
nutrients in solution enable plants to grow,
compensates for losses by transpiration,
needed by crops/animals for food output.

In general 2 + 2, but allow 3 + 1 where justified.　　　　　　**[4]**

(b) **(i)** Igneous - basalt or granite
Sedimentary - limestone or sandstone
Metamorphic - marble or slate.

3 @ 1 mark.

If the candidate attempts to give two examples for one type, both must
be correct for the mark to be awarded.　　　　　　**[3]**

(ii) Most can be used as building stone. Candidates may choose an
example with many different uses e.g. limestone for making cement, as
a fertiliser, as a (flux) cleaner in industrial processes (e.g. steel making)
and power stations.

One use stated can be sufficient for both marks provided that the
candidate describes more fully how or where it is used, for example by
naming an example of a building made from it.　　　　　　**[2]**

(iii) It results from changes that have altered the properties of either
sedimentary or igneous rocks,
heat and pressure on pre-existing rocks was responsible,
whereas igneous rocks are formed from new materials from inside the
Earth/by volcanic eruptions.

Two points made along these lines so that the difference is clearly
established.　　　　　　**[2]**

(iv) Loose at the surface and made up of smaller particle sizes than rock,
composed of minerals, organic material, air and water,
has a vertical structure to it.

One statement about soil which could not apply to rock.　　　　　　**[1]**

(c) **(i)** Area of shallow water next to the land areas - or similar. **[1]**

(ii) Fish and minerals are the two most obvious answers.
Others are possible such as salt and sea weed.

2 @ 1 provided that the candidate attempts to make them different
(e.g. stating two types of fish caught, or naming oil and gas are not
enough for both marks). **[2]**

(iii) All resources are more difficult to discover than on land because they
are less likely to be visible and discovery is both more difficult and
expensive. Some are moving resources e.g. shoals of fish and
movements are difficult to predict and discover.

All resources are more difficult and expensive to obtain at or from
under the sea; they have to be transported back to land to be used;
weather conditions are more of a problem e.g. average wind speeds
are higher at sea. Some resources are at depths beyond what current
technology allows.

Some idea = 1 mark
Fuller response = 2 marks
Well answered question = 3 marks **[3]**

(d) **(i)** Two from

fuels/direct sources of energy,
fossil fuels,
non-renewable,
formed from the decomposition of organic materials.

2 @ 1 mark **[2]**

(ii) Scale around frame completed with the unit = 1 mark
Accurate plot of the three components = 2 marks
(1 accurately plotted = 1 mark)
Key completed for the shading used = 1 mark **[4]**

(iii) Possible approaches to 'All three have increased'.

• Reasons for growth in world energy consumption such as
increased population, economic development, advent of the car,
electricity in homes etc.
• Cheapness and ease of use of these fossil fuels in relation to other
energy sources.

Why some more than others?

For the most successful answer, it will be helpful if candidate has
noticed the relative growth of oil and natural gas compared with coal.
Burning coal causes more air pollution and it is more expensive to
mine and transport and less easy to use than oil and gas. These are
the types of points that can be elaborated upon.

Credit points similar to/along the lines of those made above.

Reserve 2 marks for each part. **[5]**

(e) **(i)** Opencast mining =1 mark
Methods;
excavate a surface pit,
loosen the mineral by using dynamite,
use diggers to put mineral in the trucks,
take mineral loads out of the mine in trucks.

2 valid points = 2 @ 1 mark

Should the methods of mining be fully described in a logical order
without opencast being named, allow the 3 marks to be reached.   **[3]**

(ii) Shows clear understanding of sustainable development = 1 mark
answer.

Applied to the copper mining shown e.g. taking out a resource that is
not able to be replaced naturally, causing damage to the environment
by the size of the mining pit created, polluted water in the bottom of
the pit. Answer making points along these lines = 2 marks.   **[2]**

(f) **(i)** Possible strategies listed in the syllabus;
increased efficiency in use,
insulation in buildings,
recycling,
new technology leading to alternative/more renewable sources.

The question only asks for these to be named - maximum of 2 marks
for this part.

(ii) Problems of putting them into practice;
cost of development and application of new technology,
new technology is often more expensive in the long term,
cost of replacement of old machinery and conversion of old buildings,
recycling may be difficult to organise and has energy and other costs,
human attitude tends to be to do nothing while something else is
easier and cheaper.

Further explanation is most likely to focus upon some of the problems
of replacing fossil fuels with renewable energy sources.

Maximum of 5 marks for this part.   **[6]**

Total: 40 marks

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Page 4	Mark Scheme	Syllabus	Paper
	ENVIRONMENTAL MANAGEMENT – NOVEMBER 2004	0680	2

2 (a) (i) Plot of values - all 12 correct = 2 marks
at least 4 correct = 1 mark
Valves evenly spaced for the months = 1 mark
Line drawn through the points = 1 mark **[4]**

(ii) Lowest temperatures in the middle of the year - or similar to show that the question is understood. **[1]**

(iii) April to October **[1]**

(iv) Savanna or one of its recognised alternative names.

(Also allow (tropical) monsoon; although not in the syllabus for climate, monsoon forest included under biosphere). **[1]**

(v) Between November and March in the wet season,
this is a time of high rainfall between 84 and 208mm of rain per month, crops can be planted, tended while growing and harvested.
2 points along these lines. 2@1 mark
Mark dry season answers on their merits. **[2]**

(b) (i) Highest 1120; lowest 350 = 1 mark (allow + / Total 20) **[1]**

(ii) 770 mm is the difference = 1 mark, but allow a correct answer based on values given in the first part, provided that they were reasonable. **[1]**

(iii) Four years with more than 1000mm of rain is one approach to answering, but the realisation that rainfall totals were well above average in a number of years may be conveyed in other ways.
Understood (however expressed) = 1 mark **[1]**

(iv) • Health - insect pests breed in wet times when stagnant water is present, outbreaks of malaria and other diseases are more likely, poor health reduces the farmer's ability to work and earn income.
• Income - fields of crops may be destroyed by being flooded with water, ground too wet to allow crop growing to continue, access to fields/farm may become impossible, farm animals may be drowned.

Any 3, reserving 1 mark for health and 1 for income **[3]**

(v) Dispersion graph;
there were more years when it is drier than average than wetter than average,
in 12 years (out of 20) rainfall was less than average,
in the driest years under half of average rainfall occurred,

Should the climate graph be used instead;
virtually no rain at all/only 10mm of rain falls between April and October, for half the year no crops can be grown without irrigation.

Points made along these lines = 1 mark
Supported by quoting of values from graph or their use = 2nd mark. **[2]**

Page 5	Mark Scheme	Syllabus	Paper
	ENVIRONMENTAL MANAGEMENT – NOVEMBER 2004	**0680**	**2**

(vi) Naming of area = 1 mark
Details about water collection and use - up to 3 marks depending
upon amount of information. The third mark is only allowable if there
is something which ties content to the area named.
General answers about irrigation (absence of named area or of
identifiable references to one) = max. of 2 marks.   **[4]**

(vii) References to environmental damage may include;

- environmental problems from building large dams such as
  drowning valleys and habitat loss
- shortage of water in streams that remain leading to more erosion /
  silting up of water courses
- salination from indiscriminate water use drawing up salts to the
  surface as water evaporates
- intensive farming that can lead to over-cultivation, soil exhaustion,
  soil erosion and land degradation.
- The answer can be concentrated upon either one or a variety of
  references to environmental damage; credit mention and use of
  examples.   **[3]**

Any route to 3 marks based upon amount of relevant content included.

(viii) The water is delivered only where needed around the plant,
so that less water needs to be stored/used for the same output, less of
the water remains unused so that salination is less likely.

Some relevant explanation of the method = 1 mark
Used in relation to the theme of the question = 2nd mark   **[2]**

(c) (i) Seeds are made by scientists/by genetic modification (or words to that
effect),

whereas other seeds were developed from wild/natural plants.
1 mark for selecting from the information given
2nd mark for candidate showing some knowledge and understanding   **[2]**

(ii) Approximately correct division between USA and Argentina = 1 mark,
accurate designation of the four countries (irrespective of whether the
first task was completed successfully) = 2nd mark.   **[2]**

(iii) 1% (allow up to 1.6% if shown to be measured from graph)   **[1]**

(iv) USA   **[1]**

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Page 6	Mark Scheme	Syllabus	Paper
	ENVIRONMENTAL MANAGEMENT – NOVEMBER 2004	**0680**	**2**

(d) (i) Scientist supporting use - examples of views which can be taken from the information given in the question.

- Advantages for food output and nutrition.
- Less need for new farm land to be cleared.
- Less pollution from chemical pesticides.

A summary might be that GM crops allow more people to be fed on less land with less damage to the environment.

Environmentalist opposing their use –

- Using plants which are not naturally created.
- This is dangerous because bio-diversity is likely to be reduced.
- Some of the claims made by those in favour such as less environmental damage and more food output have not been met.

A summary might be that GM crops are dangerous because farmers are going into unchartered areas with unproven results.

Heavy reliance on use of information as provided = 1 or 2 marks.
Based on the information but explained more fully by stronger arrangement and understanding = 3 or 4 marks.   **[4]**

(ii) There is no mark for particular view expressed; all the marks are for explanation by supporting one and/or rejecting the other.

Views are expressed, but are explained by sticking close to information provided = 1 or 2 marks.

The views expressed are supported by well ordered arguments = 3 or 4 marks.   **[4]**

Total 40 marks